Release notes for ENDF/B Development n-005_B_010 evaluation

ENDF
B-VII.dev

April 26, 2017

- `fudge-4.0` Warnings:

  1. Breakup into e+e- pairs not yet supported by fudge
     Reading ENDF file: ../n-005_B_010.endf (Error # 0): e+e- pairs

     ```
     WARNING: LR = 40 for MT = 604 is being ignored
     ```

  2. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 0: total (Error # 0): CS Sum.

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 14.52%
     ```

  3. Cross section does not match sum of linked reaction cross sections
     crossSectionSum label 1: nonelastic (Error # 0): CS Sum.

     ```
     WARNING: Cross section does not match sum of linked reaction cross sections! Max diff: 41.23%
     ```

- `fudge-4.0` Errors:

  1. Exception Exception was thrown
     *Reading ENDF file: ../n-005_B_010.endf / Traceback (most recent call last): / File
     "/home/dbrown/fudge.trunk/fudge/legacy/converting/ENDFToGND/ENDF_ITYPE_0_Misc.py",
     line 3142, in parseReaction (Error # 0): Exception*

     ```
     if( decayZAs != residualZA ) : raise Exception( "decayZAs = %d != residualZA = %d" % ( decayZAs, residualZA ) )
     ```

  2. Exception Exception was thrown
     Reading ENDF file: ../n-005_B_010.endf (Error # 2): Exception

     ```
     Exception: decayZAs = 2004 != residualZA = 4008
     ```

  3. Found a negative probability
     *reaction label 0: n + B10 / Product: n / Distribution: / angularTwoBody - XYs2d:
     (Error # 0): Negative prob.*

     ```
     WARNING: Negative probabilities encountered. Incident energy: 1.65e7 eV, worst case: -0.00020033220136
     WARNING: Negative probabilities encountered. Incident energy: 1.7e7 eV, worst case: -9.76086343781e-05
     ```

  4. Calculated and tabulated Q values disagree.
     reaction label 42: He4 + Li7 (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: 4324203.946784973 eV vs 2789323. eV!
     ```

  5. Calculated and tabulated Q values disagree.
     reaction label 43: He4 + (Li7_e1 ->Li7 + photon) (Error # 0): Q mismatch

     ```
     WARNING: Calculated and tabulated Q-values disagree: 3846352.946784973 eV vs 2311472. eV!
     ```

  6. Energy range of data set does not match cross section range
     *production label 46: /reactionSuite/reactions/production[@label='46'] / Product: photon
     / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)*

     ```
     WARNING: Domain doesn't match the cross section domain: (6631935.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
     ```

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7. Energy range of data set does not match cross section range
production label 46: /reactionSuite/reactions/production[@label='46'] / Product: photon__a / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (5684092.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

8. Energy range of data set does not match cross section range
production label 46: /reactionSuite/reactions/production[@label='46'] / Product: photon__b / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (5254914.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

9. Energy range of data set does not match cross section range
production label 46: /reactionSuite/reactions/production[@label='46'] / Product: photon__c / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (5684092.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

10. Energy range of data set does not match cross section range
production label 46: /reactionSuite/reactions/production[@label='46'] / Product: photon__d / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (5254914.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

11. Energy range of data set does not match cross section range
production label 46: /reactionSuite/reactions/production[@label='46'] / Product: photon__e / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (3948451.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

12. Energy range of data set does not match cross section range
production label 46: /reactionSuite/reactions/production[@label='46'] / Product: photon__f / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (5684092.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

13. Energy range of data set does not match cross section range
production label 46: /reactionSuite/reactions/production[@label='46'] / Product: photon__g / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (5684092.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

14. Energy range of data set does not match cross section range
production label 46: /reactionSuite/reactions/production[@label='46'] / Product: photon__h / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (3948451.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

15. Energy range of data set does not match cross section range
    production label 46: /reactionSuite/reactions/production[@label='46'] / Product: pho-ton__i / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mis-match (a)

```
WARNING: Domain doesn't match the cross section domain: (2371316.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

16. Energy range of data set does not match cross section range
    production label 46: /reactionSuite/reactions/production[@label='46'] / Product: pho-ton__j / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mis-match (a)

```
WARNING: Domain doesn't match the cross section domain: (5684092.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

17. Energy range of data set does not match cross section range
    production label 46: /reactionSuite/reactions/production[@label='46'] / Product: pho-ton__k / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mis-match (a)

```
WARNING: Domain doesn't match the cross section domain: (2371316.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

18. Energy range of data set does not match cross section range
    production label 46: /reactionSuite/reactions/production[@label='46'] / Product: pho-ton__l / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mis-match (a)

```
WARNING: Domain doesn't match the cross section domain: (3948451.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

19. Energy range of data set does not match cross section range
    production label 46: /reactionSuite/reactions/production[@label='46'] / Product: pho-ton__m / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mis-match (a)

```
WARNING: Domain doesn't match the cross section domain: (1915446.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

20. Energy range of data set does not match cross section range
    production label 46: /reactionSuite/reactions/production[@label='46'] / Product: pho-ton__o / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mis-match (a)

```
WARNING: Domain doesn't match the cross section domain: (2371316.0 -> 20000000.0) vs (790713.8 -> 20000000.0)
```

21. Energy range of data set does not match cross section range
    production label 47: /reactionSuite/reactions/production[@label='47'] / Product: photon / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6645209.0 -> 20000000.0) vs (1e-05 -> 20000000.0)
```

22. Energy range of data set does not match cross section range
    production label 47: /reactionSuite/reactions/production[@label='47'] / Product: pho-ton__a / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mis-match (a)

```
WARNING: Domain doesn't match the cross section domain: (6311246.0 -> 20000000.0) vs (1e-05 -> 20000000.0)
```

23. Energy range of data set does not match cross section range
production label 47: /reactionSuite/reactions/production[@label='47'] / Product: photon__b / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6309584.0 -> 20000000.0) vs (1e-05 -> 20000000.0)
```

24. Energy range of data set does not match cross section range
production label 47: /reactionSuite/reactions/production[@label='47'] / Product: photon__c / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (3458281.0 -> 20000000.0) vs (1e-05 -> 20000000.0)
```

25. Energy range of data set does not match cross section range
production label 47: /reactionSuite/reactions/production[@label='47'] / Product: photon__d / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6645209.0 -> 20000000.0) vs (1e-05 -> 20000000.0)
```

26. Energy range of data set does not match cross section range
production label 47: /reactionSuite/reactions/production[@label='47'] / Product: photon__e / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6552747.0 -> 20000000.0) vs (1e-05 -> 20000000.0)
```

27. Energy range of data set does not match cross section range
production label 47: /reactionSuite/reactions/production[@label='47'] / Product: photon__f / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6311246.0 -> 20000000.0) vs (1e-05 -> 20000000.0)
```

28. Energy range of data set does not match cross section range
production label 47: /reactionSuite/reactions/production[@label='47'] / Product: photon__g / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6309584.0 -> 20000000.0) vs (1e-05 -> 20000000.0)
```

29. Energy range of data set does not match cross section range
production label 47: /reactionSuite/reactions/production[@label='47'] / Product: photon__h / Distribution: / uncorrelated - angular - isotropic: (Error # 0): Domain mismatch (a)

```
WARNING: Domain doesn't match the cross section domain: (6552747.0 -> 20000000.0) vs (1e-05 -> 20000000.0)
```

30. Multiplicity domain does not match domain of linked product multiplicity sum
multiplicitySum label 9: (z,p) total gamma multiplicity (Error # 0): summedMultiplicityDomainMismatch

```
                WARNING: Multiplicity domain does not match domain of linked product multiplicity sum
```

- `inter4web` Failures:

  1. AttributeError("'columnHeader' object has no attribute 'unit'",)
     Run failed!

     ```
     Traceback (most recent call last):
       File "/home/dbrown/advance.trunk/src/advance/code_runner.py", line 215, in run
         run_results, stdout_result, stderr_result = self._run( workdir, prefix, non_error_list = non_error_list )
       File "/home/dbrown/advance.trunk/src/project_endf/code_runners/inter4web_runner.py", line 306, in _run
         header.append('%s (%s)' % (metric.name,metric.unit))
     ... [2 more lines]
     ```

- `njoy2012` Warnings:

  1. This nuclide has no URR and NJOY is upset about it
     unresr...calculation of unresolved resonance cross sections (0): No URR

     ```
        ---message from unresr---mat   525 has no resonance parameters
                         copy as is to nout
     ```

  2. Cross sections were found for charged-particle levels in the 600 or 700 series of MT numbers, but no corresponding angular distributions were found. Isotropy is assumed to enable the calculation to proceed, but this evaluation should be upgraded to include the proper sections of File 4 or 6.
     heatr...prompt kerma (0): HEATR/hinit (1)

     ```
        ---message from hinit---mf4 and 6 missing, isotropy assumed for mt 600
     ```

  3. Cross sections were found for charged-particle levels in the 600 or 700 series of MT numbers, but no corresponding angular distributions were found. Isotropy is assumed to enable the calculation to proceed, but this evaluation should be upgraded to include the proper sections of File 4 or 6.
     heatr...prompt kerma (1): HEATR/hinit (1)

     ```
        ---message from hinit---mf4 and 6 missing, isotropy assumed for mt 601
     ```

  4. Cross sections were found for charged-particle levels in the 600 or 700 series of MT numbers, but no corresponding angular distributions were found. Isotropy is assumed to enable the calculation to proceed, but this evaluation should be upgraded to include the proper sections of File 4 or 6.
     heatr...prompt kerma (2): HEATR/hinit (1)

     ```
        ---message from hinit---mf4 and 6 missing, isotropy assumed for mt 602
     ```

  5. Cross sections were found for charged-particle levels in the 600 or 700 series of MT numbers, but no corresponding angular distributions were found. Isotropy is assumed to enable the calculation to proceed, but this evaluation should be upgraded to include the proper sections of File 4 or 6.
     heatr...prompt kerma (3): HEATR/hinit (1)

     ```
        ---message from hinit---mf4 and 6 missing, isotropy assumed for mt 603
     ```

6. Cross sections were found for charged-particle levels in the 600 or 700 series of MT numbers, but no corresponding angular distributions were found. Isotropy is assumed to enable the calculation to proceed, but this evaluation should be upgraded to include the proper sections of File 4 or 6.
heatr...prompt kerma (4): HEATR/hinit (1)

```
   ---message from hinit---mf4 and 6 missing, isotropy assumed for mt 604
```

7. Cross sections were found for charged-particle levels in the 600 or 700 series of MT numbers, but no corresponding angular distributions were found. Isotropy is assumed to enable the calculation to proceed, but this evaluation should be upgraded to include the proper sections of File 4 or 6.
heatr...prompt kerma (5): HEATR/hinit (1)

```
   ---message from hinit---mf4 and 6 missing, isotropy assumed for mt 605
                                             temp 1      0.1s
```

8. This nuclide has no URR and NJOY is upset about it
purr...probabalistic unresolved calculation (0): No URR

```
   ---message from purr---mat  525 has no resonance parameters
                      copy as is to nout
```

- njoy2012 Errors:

  1. An angular distribution is negative
     acer...monte carlo neutron and photon data (0): Neg. P(Ejµ) (b)

     ```
        ---message from ptleg2---negative probs found
                          20 for mt=  2 e= 1.650E+07
     ```

  2. An angular distribution is negative
     acer...monte carlo neutron and photon data (1): Neg. P(Ejµ) (b)

     ```
        ---message from ptleg2---negative probs found
                          15 for mt=  2 e= 1.700E+07
     ```

- xsectplotter Warnings:

  1. Breakup into e+e- pairs not yet supported by fudge
     ********** Reading ../n-005_B_010.endf ********** / 604 [3] (Error # 0): e+e- pairs

     ```
        WARNING: LR = 40 for MT = 604 is being ignored
     ```

- xsectplotter Errors:

  1. Generic error message
     (Error # 1): Error

     ```
        ERROR: Plot generation failed!!!
     ```

  2. Generic error message
     (Error # 2): Error

```
ERROR: Plot generation failed in stdout!!!
```

3. Exception Exception was thrown
   ********** Reading ../n-005_B_010.endf ********** / File "/home/dbrown/fudge.trunk/fudge/legacy/conver
   line 3142, in parseReaction (Error # 0): Exception

   ```
   if( decayZAs != residualZA ) : raise Exception( "decayZAs = %d != residualZA = %d" % ( decayZAs, residualZA ) )
   ```

4. Exception Exception was thrown
   ********** Reading ../n-005_B_010.endf ********** (Error # 45): Exception

   ```
   Exception: decayZAs = 2004 != residualZA = 4008
   ```